

5209 5210

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5209 5210

Form 504
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
~~CONFIDENTIAL~~
State: Territory of Hawaii
11-5613
DESCRIPTIVE REPORT.
Hydrographic Sheet No. 5209 5210
PURSUANT TO GUIDELINES AS DESCRIBED IN SECTION 3.3(a), EXECUTIVE ORDER 12356.
LOCALITY:
Maro-Dowsett Reef
1930-1931
CHIEF OF PARTY:
O. W. Swainson

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES

NOV 8 1932

REG. NO.

5209

HYDROGRAPHIC TITLE SHEET

Acc. No. _____

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 21

REGISTER NO.

State Territory of Hawaiian Is.

General locality Westward islands West of Gardner Pinnacles

Locality Maro-Dowsett Reef (Southern Part)

Scale 1:20,000 Date of survey Oct. 1930 and June-July, 1931.

Vessel PIONEER

Chief of Party O. W. Swainson

Surveyed by E. O. Heaton, P. L. Bernstein, V. M. Gibbens

Protracted by C. J. Wagner

Soundings penciled by C. J. Wagner

Soundings in fathoms feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by _____

Inked by *Bo Strain*

Verified by *ES*

Instructions dated February 10, 19 30

Remarks: _____

DECLASSIFIED BY NOAA
PURSUANT TO DOC SYSTEMATIC REVIEW
5209
GUIDELINES AS DESCRIBED IN SECTION
3.3(a), EXECUTIVE ORDER 12356.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

U. S. COAST & GEODETIC SURVEY
LIBRARY AND ARCHIVES

NOV 8 1932

REG. NO. 5210

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 22

REGISTER NO.

DECLASSIFIED BY NOAA
PURSUANT TO DOC SYSTEMATIC REVIEW
5210 LINES AS DESCRIBED IN SECTION
3.3(a), EXECUTIVE ORDER 12356.

State ~~Territory of~~ Hawaiian Is.

General locality ~~Westward Islands~~ West of Gardner Pinnacles

Locality ~~Maro-Dowsett~~ Reef (Northern Part)

Scale 1:20,000 Date of survey June-July, 19 31

Vessel PIONEER

Chief of Party O. W. Swainson

Surveyed by E. O. Heaton, P. L. Bernstein, V. M. Gibbens

Protracted by J. C. Ellerbe

Soundings penciled by C. J. Wagner

Soundings in fathoms feet

Plane of reference M.L.L.W.

Subdivision of wire dragged areas by

Inked by

Verified by

Instructions dated February 10, 1930, 19

Remarks:

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SHEETS 21 & 22.

AUTHORITY FOR SURVEY

Hydrographic sheets numbers ⁵²⁰⁹ 21 and ⁵²¹⁰ 22 were executed in accordance with orders dated February 10, 1930, to the Commanding Officer of the ship PIO-NEER for project number 55.

AREA AND SCALE OF SHEETS

Both sheets cover the area inside ~~Maro-Dowsett~~ Reef and out to the junction of the ship work on sheets 44, 45, and 46. There is only one reef and not a Maro and a Dowsett as shown on previous charts. The scale of the sheets is 1:20,000.

CONTROL

There were no rocks, bare reefs, or other dry land on which astronomical observations could be made. Consequently, the position of a control buoy had to be determined by sextant observations.

Sights were taken on a total of 46 stars by three officers at buoy No. 4 and 14 stars at No. 3. Buoy 3 was connected to No. 4 by sun azimuth and R.A.R. distance. This gave a total of 60 star observations as follows:- October 6; O. W. Swainson 6 stars, C. K. Green 7 stars, and E. O. Heaton 6 stars: October 9; C. K. Green 7 stars, and E. O. Heaton 7 stars: October 11; C. K. Green 7 stars, and E. O. Heaton 7 stars: October 15; O. W. Swainson 4 stars, C. K. Green 5 stars, and E. O. Heaton 6 stars. Through a system of horizontal sextant angles, sun azimuths, and R.A.R. distances, other buoys and signals on the reefs were tied in to Buoy No. 4. A set of observations was taken at signal Kor by O. W. Swainson, C. K. Green, and E. O. Heaton. The difference between the position thus obtained and that carried from Buoy No. 4 was six seconds in latitude and thirty-six seconds in longitude.

Station Fish was semi-permanently marked at the close of the 1930 season by driving an iron stake into the coral reef. In 1931 this station was recovered and the control carried from it by sun azimuths and R.A.R. distances between buoys Able, Boy, and Cat. Thus 1930 and 1931 seasons are on the same datum plane. See report for 44, 45, and 46 for computation and position of signals.

The two-barrel type floating buoys were used, augmented by tripod signals on the reef and auxiliary small water signals.

Considerable difficulty was encountered with making signal Mark check. It apparently had too light an anchor and too long an anchor line, as angles observed at it to other signals showed it moved around considerably.

SURVEY METHODS

All the sounding was done by launch parties with the exception of one or two filling-in lines at the outer edges which were done by the ship using the fathometer. The launches used the hand lead entirely. The hand leads were checked in accordance with the regulations.

the executive officer on the PIONEER, at the time of the survey, hence no comments are necessary here.

NAME *

As there is but one reef instead of two as shown on previous charts, it can be called Maro Reef, Dowsett Reef, or a combination of the two, such as Maro-Dowsett Reef.

JUNCTION OF SHEETS

Sheet 21 Covers the southern half of the reef and 22 the northern portion. No. 21 joins ship sheet 44 on the east and south and 45 on the west. No. 22 joins 45 on the west and 46 on the north and east.

While there is very little overlap in the junctions of the sheets the junction seems sufficient for the purpose with the exception that at one place there is a too large gap between sheet 22 and 46. This gap is of very little real importance, however, as vessels must not enter the area unless the visibility is excellent for seeing coral heads.

The launch failed to develop the sunken reef indicated to them as being in the extreme northeast corner of their sheet 22. However, the approximate depths and location of it as shown on sheet 46 is very close.

In many places where the fathometer soundings overlap the hand lead soundings the former are one fathom less than the latter. This is usually due to tide correction and fractional fathom fathometer reading. In some cases the discrepancy might be caused by the reader leaning a little toward the lower flashes than the mean. Also the lead line might not have been up and down. In any case the discrepancy is not serious.

STATISTICS

Sheet 21

Number of positions. 1202.
Number of soundings. 4213.
Number of statute miles of sounding lines. 230.

Sheet 22

Number of positions. 958.
Number of soundings. 3716.
Number of statute miles of sounding lines. 192.

*O. W. Swainson
Comdg. Ship Pioneer*

* name has been changed to "Maro Reef."
See memorandum of Feb. 7, 1933, H. Bacon,
attached to this report.

It was not attempted to locate all the shoal spots, but enough of them to indicate the character of the area surveyed, and to show where a vessel could anchor or navigate, and where it could not. In many places the lines were widely spaced, but sufficient dangers were located to prove the area foul.

TIDES

The soundings were reduced from observations taken at Honolulu. No time or height correction was applied to the Honolulu values.

MAGNETICS

No magnetic observations were taken.

ANCHORAGES

Vessels may anchor in the shelter of the reef on any side. The closer to the reef the more caution is necessary to avoid the isolated coral heads. These coral heads can usually be seen in favorable sun light. Good shelter is obtained on the west side between the long reef projecting to the northwest and the one to the southwest. Care must be taken to avoid the shoal spot off the middle of the entrance. Vessels in entering should keep within one-half mile of the southwest line of reef. However, unless the navigator is familiar with the area, he should remain as far from the main reef on all sides as he can obtain the desired shelter.

Small boats can pass through the reefs at a few places and obtain perfect shelter inside.

DANGERS

There is nothing visible by which a navigator can definitely locate himself. Breakers or the light blue color of the area inside the reef give the first warning of the proximity to the reef. Consequently, all maneuvering in the vicinity of the reef must be done with caution, and with the sea and light such that shoal spots can be seen and avoided. Ordinarily spots with less than six fathoms of water are plainly visible. The reefs indicated on the sheets have from a few inches to two fathoms of water over them. There is only one small rock which shows above high water. This is on the north edge of the reef. On H. 5210, Lat. $25^{\circ} 29.8'$, Long. $170^{\circ} 38.3'$.

There are no dangers over one and one-half miles from the general outline of the reef.

Small vessels drawing up to six feet can pick their way through the reef. Extreme vigilance must be exercised, however.

CURRENTS

The currents are not over one-half knot on the area. Their direction varies with the wind and tide but generally they are of a clockwise direction around the reef.

COAST PILOT

The Coast Pilot of the Hawaiian Islands is being rewritten by Lt. Green,

MARO - DOWSETT REEF, HAWAIIAN ISLANDS

This reef lies in the Hawaiian Island Group, Pacific Ocean, about 635 miles 288° true from Kawai and 133 miles 290° true from Gardner Island. It is a coral reef, rectangular in shape, with the center in latitude 25° 25' N., longitude 170° 35' W. The reef is about 13½ miles long in a northwesterly direction and 5 miles wide. On the northwest and southeast end there is a well-defined barrier reef covered with breakers the depths varying from 1 foot to 2 fathoms. The most extensive reefs are on the northwest end. The remainder is very broken with numerous reefs and coral heads. Small vessels, drawing up to 6 feet can pick their way through the reef, especially in the central portion.

The reef has borne two names, MARO and DOWSETT and was once thought to be two separate reefs. The survey of 1930-31 reveals it to be one reef or a single geographic feature. The reef was first discovered in 1820 by Captain Allen of the whaler Maro and named Maro Reef by him after his vessel. (See H.O., List of Reported Dangers in the Pacific, Nos. 180 to 182.) On July 4, 1872, the brig Kamehameha commanded by Captain Dowsett struck on the southeast end of the reef and the reef was named DOWSETT after the captain. The geographic position of the reef differed so much from Maro Reef that they were thought to be two separate reefs and were so published on various charts.

Since the reef is a single geographic feature, the double name MARO-DOWSETT, should be discarded and a single one adopted. The name MARO REEF has priority by 52 years, it the more euphonic name, is named after a vessel rather than a person and is the preferred usage of geographers and navigators. It is recommended that the name be changed to MARO REEF and that the name be submitted to the U. S. Geographic Board for approval.

Respectfully submitted

Harlow Bacon, Cartographer,
U.S. Coast and Geodetic Survey.

Feb. 7, 1933.

Card sent to U.S. Geog Board, Feb. 13, 1933.

COMMANDING OFFICER'S REPORT OF INSPECTION OF RECORDS AND SHEETS

The sounding records were examined to see that they were in order and that there was no doubtful entries. The smooth sheets were examined for misleading or insufficient detail. Comparison was made of the junction of sheets. The plotting of the positions and soundings was not checked other than by comparing them with the boat sheets.

O. W. Swainson
O. W. Swainson,
H. & G. Engineer,
Commanding PIONEER.

February 10, 1933.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
5 volumes of sounding records for

HYDROGRAPHIC SHEET 5209

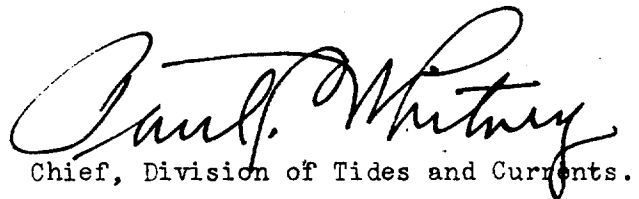
Locality Maro - Dowsett Reef (Southern Part), Hawaiian Islands

Chief of Party: O. W. Swainson in 1930 - 1931
Plane of reference is mean lower low water, reading
3.5 ft. on tide staff at Honolulu
17.3 ft. below B. M. 2

Time allowance ± 1 hour, range $\frac{1}{2}$ as large at place of sounding.
Height of mean higher high water above plane of reference 1-foot

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.


Chief, Division of Tides and Currents.

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. *5209*

The following statistics will be submitted with the
cartographer's report on the sheet:

Number of positions on sheet	<i>1202</i>
Number of positions checked	<i>412</i>
Number of positions revised	<i>23</i>
Number of soundings recorded	<i>4213</i>
Number of soundings revised	<i>98</i>

Number of signals erroneously

plotted or transferred

0

2% of total number of positions erroneously plotted.

2.3% of " " " soundings revised

Date: *March 18 1933*

Cartographer: *Ed. L. L. L.*

February 10, 1933.

Division of Hydrography and Topography:

✓ Division of Charts:

Tide Reducers are approved in
5 volumes of sounding records for

HYDROGRAPHIC SHEET 5210

Locality Maro -Dowsett Reef (Northern Part), Hawaiian Islands.

Chief of Party: O. W. Swainson in 1931

Plane of reference is mean lower low water reading

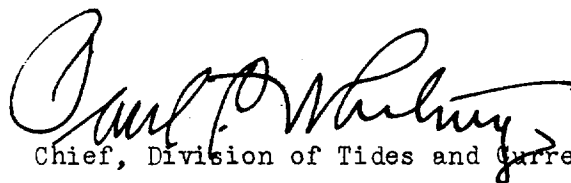
3.5 ft. on tide staff at Honolulu

17.3 ft. below B. M. 2

Time allowance +1 hour, range $\frac{1}{2}$ as large at place of sounding
Height of mean higher high water above plane of reference 1-foot.

Condition of records satisfactory except as checked below:

1. Locality and sublocality of survey omitted.
2. Month and day of month omitted.
3. Time meridian not given at beginning of day's work.
4. Time (whether A.M. or P.M.) not given at beginning of day's work.
5. Soundings (whether in feet or fathoms) not clearly shown in record.
6. Leadline correction entered in wrong column.
7. Field reductions entered in "Office" column.
8. Location of tide gauge not given at beginning of day's work.
9. Leadline corrections not clearly stated.
10. Kind of sounding tube used not stated.
11. Sounding tube No. entered in column of "Soundings" instead of "Remarks".
12. Legibility of record could be improved.
13. Remarks.



Chief, Division of Tides and Currents.

Field Records Section (Charts)

HYDROGRAPHIC SHEET No. .52.10

The following statistics will be submitted with the
cartographer's report on the sheet:

Number of positions on sheet	958
Number of positions checked	396
Number of positions revised	42
Number of soundings recorded	3716
Number of soundings revised	49
Number of signals erroneously plotted or transferred	✓

Date: April 13, 1933
Cartographer: Gaylord H. Street

Section of Field Records
Surveyed 1930 and 1931
Report on H 5209.

Chief of Party, O. W. Swainson
Surveyed by E. O. Heaton, P. Bernstein, and V. W. Litten
Projected by C. J. Wagner
Soundings plotted by C. J. Wagner
Verified and Inked by Les. S. Straw

1. The records conform to the requirements of the General Instructions.
2. The plan and character of the work fulfill the requirements of the General Instructions.
3. The plan and extent of development satisfy the Specific Instructions (Feb. 10, 1930) - PIONEER
4. The sounding line crossings are considered adequate for this survey.
5. The usual depth curves can be completely drawn with the exception of places where they fall close to submerged reefs.
6. The field plotting was completed to the extent prescribed in the Hydrographic Manual.
7. No part of the drafting done by the field was done over in the office.
8. This sheet (H 5209) is joined on the south, east and west by H 5214 and on the north by H 5210. The junction with H 5210 will be considered when that sheet has been verified. The junction of this sheet H 5209 with H 5214 (fathometer work) is satisfactory (See Descriptive Report - last paragraph under "Junction of Sheets.")

9 Remarks:

(a) In the development of the shoal spot
Lat $25^{\circ}18'50''$
Long $170^{\circ}31'$ there is a 4 fathom and a 10
fathom sounding at position 1b and 2b
respectively (Vol. page 13 of record). The 4 fathom
and 10 fathom soundings are completely
encompassed by 13 and 14 fathoms of
water. The shoal spot was "marked"
according to the record Vol. page 13 "b" day
and between pos 39 and 40 c. Vol. page 31
on "c" day the note "Cruising to locate shoal
spot position #1 b day" appears. Line 40-43 c
runs about 40 meters west of position
1b (4 fathoms) with a depth of 13 to 14 fathoms.
Lines 37-38 c on the north and 38-39 c on the
east of pos. 1b and both 40 meters from it
show 13 to 14 fathoms. Line 34-35 c on the
south is about 20 meters from pos. 1b
and shows 13 fathoms of water. Position
2b (10 fathoms) falls about 20 meters
east of a 13 fathom sounding on line 29-30 c.
Line 32-33-34 c to the east and north of 2b
approximately 80 meters show 13 fathoms
of water. Positions 1b and 2b as plotted
according to the record on the Smooth
Sheet agreed respectively to the positions
on the boat sheet. Apparently these are
isolated shoal spots and are not
connected to or included by the
shoal area 150 meters westward.

(b) The sounding lines on "a" and "b"
days (Green - Port M.S.) are unusually
irregular, due to the location of shoal
spots by steering over or close to them.
The development in this area is not

as complete as it is throughout the
balance of the area covered by this sheet.
This may account, in part, for the slight
change in the character of the curves.

10. The survey is considered satisfactory for
the purpose intended.

Respectfully Submitted

L. A. Thaw

March 18/1933.

Section of Field Records

Report on H-5210

Surveyed in 1931

Chief of Party O.W. Swainson

Surveyed by C.O. Heston

Protected by J.C. Ellerbe

P.L. Bernstein

U.M. Gibbons

Verified & inked by G.H. Streeter

Sounding plotted by C.J. Wagner

1. The compass heading and speed of the boat are not always given otherwise the records conform to the requirements of the general instructions.
2. The usual depth curves cannot be drawn.
3. The field plotting was completed.
4. It was necessary for the office draftsman to replot red "A" day, sixteen positions. This day was originally plotted from an incorrect position of "O Line". This position is located correctly on the sheet and checked with H-5215 as mentioned in the Description Report. The field plotting was made from a position about 40 meters S.E. of the correct location.
5. The junction with adjacent sheets is fairly satisfactory. H-5214 is from one to two fathoms shallower.
6. The boat sheets do not always agree with the smooth sheet when day letters are concerned. Blue "c" day is plotted on the boat sheet as green "a". Blue "f" day is plotted on the boat sheet as green "b".

At Long. $170^{\circ}-35.35'$ - Lat. $25^{\circ}-22'.5$, lines 76 to 77 green "a" and 56-57 blue "c" do not agree as to a shoal area mentioned on line 76-77 "a".

7. The quality of the work is good.

Respectfully submitted,

G. H. Street

April 13, 1933

SECTION OF FIELD RECORDS

Review of Hydrographic Sheet No. 5209
Maro Reef, West of Gardner Pinnacles, Hawaiian Islands.
Surveyed October 1930 and June - July 1931.
Instructions dated Feb. 10, 1930. (Pioneer Proj. 55).

Chief of Party - O. W. Swainson
Surveyed by - E. O. Heaton, P. L. Bernstein, V. M. Gibbens.
Protracted and soundings plotted by - C. J. Wagner.
Verified and inked by - Leo S. Straw.

1. The records conform to the requirements of the Hydrographic Manual.
2. The plan and extent of development satisfy the specific instructions except that channels through the reef have not been developed. Both channels and anchorages have been described in the descriptive report in general terms.
3. Soundings indicate the general character of the area covered by the sheet. Only enough development was done to show its unsuitability for anchorage. The descriptive report states "It was not attempted to locate all the shoal spots, but enough of them to indicate the character of the area surveyed, ----".

The reefs although inked on the sheet by the symbol for coral reef bare at mean lower lowwater, "have from a few inches to two fathoms of water over them". They are easily recognized by their color in suitable light.

4. Depth curves. - The development is not sufficient to draw depth curves with any degree of accuracy. The curves shown on the sheet serve to emphasize the located shoals but should not be regarded as showing the form or outline of the shoal areas.

5. Junction is made with sheet H. 5214 on the east, south and west. The agreement in depths is not satisfactory even though the bottom is very irregular. In lat. $25^{\circ}18'.6$ long. $170^{\circ}29'.8$ an 11 on a fathometer line falls between two 19 on this sheet (H. 5209). All the soundings on the fathometer line, 10E to 13E, are 2 or 3 fathoms shoaler than indicated by the launch work. A fathometer 12 plots on a launch work 17 in lat. $25^{\circ}19'.64$ long. $170^{\circ}28'.85$. Many lesser differences occur in the overlapping area with the fathometer depths in most cases showing the lesser water. The differences are probably due to the use of too light a lead (6 lbs.) in the handlead work and they should not be regarded as a disparagement of the fathometer work in this area. Several shoals were not corroborated in the overlap, see par. 3. To the north this sheet joins H. 5210 across the main body of Maro Reef. The latter sheet is in process of being verified and inked.

6. Comparison:- No previous survey is available for comparison. Chart 4000 shows the reef from a preliminary report. For a history of the reef see report to U. S. Geo. Board filed with the Descriptive Report.

7. Recommendation:- Although the survey is incomplete in details, further surveys are not deemed necessary for the usual charting purposes; but consideration should be given to the placing of descriptive notes, or a reference to the Coast Pilot, on the chart as a caution to the mariner. Special attention is directed to statements in the Descriptive Report, see par. 3 and 4 above.

H. 5209.

This sheet (H. 5209) should not be issued for confidential use without pertinent extracts from the Descriptive Report to show its limitations. A photo survey of the reef with this survey as control probably would serve military purposes to the best advantage.

DECLASSIFIED BY NOAA
PURSUANT TO DOC SYSTEMATIC REVIEW
GUIDELINES AS DESCRIBED IN SECTION
3.2(a), EXECUTIVE ORDER 12356.

8. Reviewed by R. J. Christman, April 5, 1955.

Inspected: E. P. Ellis.

Approved: L. O. Colbert, Chief, Section of Field Records.

as a reconnaissance.

This is a reconnaissance survey of the approach to the reef. It is entirely possible that anchorages may exist in areas not developed within the barrier reef.

E. P. Ellis

APPROVED

APPROVED

J. S. Dole
Fred Cook
G. H. de

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

AND REFER TO No. 82-DRM

WASHINGTON

July 25, 1933.

SECTION OF FIELD RECORDS

Review of Hydrographic Sheet No. 5210 (Confidential)

Northern part of Mako Reef, Hawaiian Is.

Surveyed in 1931

Instructions dated Feb. 10, 1930 (Private)

Hand lead and fathometer soundings

DECLASSIFIED BY NOAA
PURSUANT TO DOC SYSTEMATIC REVIEW
GUIDELINES AS DESCRIBED IN SECTION
3.3(a), EXECUTIVE ORDER 12356.

Chief of Party, O. W. Swainson
Surveyed by E. O. Heaton, P. L. Bernstein, V. M. Gibbons
Protracted by J. C. Ellerbe
Soundings plotted by C. J. Wagner
Verified by G. H. Streeter

1. The records conform to the requirements of the Hydrographic Manual except that the stamped form descriptive of the sounding apparatus was not completely filled out. The weight of the lead used in hand lead work was entered as 9 lbs. on blue e day and f day, but was not given on other days. As a 6 lb. lead was used in the work on the adjoining sheet H. 5209, this information was of some importance.
2. The plan and extent of the survey satisfy the instructions except that small boat passages through reefs were not developed (paragraph 16a), but it is doubtful if this was meant to apply to an area of this character.
3. There are only a few cross lines on the southwest corner of the sheet. The fathometer soundings are slightly shoaler than the hand lead soundings but the discrepancy is seldom more than one fathom. On the greater part of the sheet only enough development was done to show the character of the bottom. The descriptive report states, "It was not attempted to locate all the shoal spots, but enough of them to indicate the character of the area surveyed and to show where a vessel could anchor or navigate and where it could not."
4. The usual reef symbol for reefs bare at mean lower low water has been inked on the sheet, for the reefs sketched by the field party, but these reefs are not entirely bare as they have anywhere from a few inches to two fathoms of water over them in some places. See paragraph under "Dangers" in the descriptive report.
5. Depth curves - the information is not sufficient for drawing the depth curves except in the small area in the southwest corner of the sheet. On the other portion of the sheet, curves have been inked only around some of the isolated shoal spots as the sounding lines are too widely spaced to draw the outline of shoal areas with any degree of accuracy.

6. The junction on the west with H. 5214 and H. 5215 is satisfactory although the fathometer soundings from H. 5214 are generally about one fathom shallower than the hand lead soundings on this sheet, H. 5210. A closer junction should have been made on the east with H. 5214.

The junction on the south with H. 5209, across the main body of Moro Reef, is not at all close. Additional lines might have been run between long. $170^{\circ} 30'$ and long. $170^{\circ} 36'$.

The junction on the north with H. 5215 is not satisfactory. There is a large gap between long. $170^{\circ} 35'$ and long. $170^{\circ} 40'$ and another gap west of long. $170^{\circ} 31'$.

7. Character and scope of surveying - This survey has not the accuracy of the usual hydrographic survey as it is dependent upon the position of a control buoy as determined by sextant observations on a star, (see paragraph 3, descriptive report). Signal "Mark" was found to have been constantly moving during the progress of the work. In scope the survey is incomplete and lacking in details but gives a very good idea of the character of the area.

This sheet, H. 5210, should not be issued for confidential use without pertinent extracts from the descriptive report to show its limitations. A photo survey of the reef with this survey as control probably would serve military purposes to the best advantage. (See memo. below.)

8. Additional work is recommended to fill in the gap between the northern limits of this sheet, H. 5210, and the limits of H. 5217, from long. $170^{\circ} 35'$ to long. $170^{\circ} 40'$.

9. Reviewed by R. L. Johnston. April 20, 1933.

Sheet inspected by A. L. Shalewitz. See memorandum attached.


Memorandum by A. L. Shalowitz

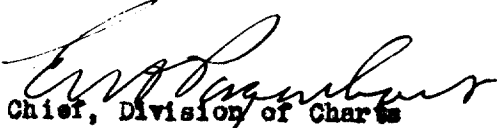
1. Delineation of coral reefs - Attention is called to the fact that the coral reefs indicated on the sheet, with very few exceptions, have not been accurately located. Only in those cases where a sounding line runs in close proximity to the reef is there any semblance of accuracy. In many cases the limits and extent of the reefs have been sketched on the boat sheet from estimated distances running as much as 600 meters (see pos. 7 f, blue). The reefs were plotted on the smooth sheet by the field party and were accepted by the verifier.


2. Character of the work - With the exception of the area at the western end of the sheet, the remainder of the survey is of a very approximate and incomplete nature. The sparseness of the sounding lines over the major portion of the sheet and the approximate location of many of the coral reefs, together with the inability to completely draw most of the depth curves, requires that the survey be classed as reconnaissance and as indicating in a general way only the character of the area surveyed.

Approved as reconnaissance sheet:


Chief, Section of Field Records


Chief, Section of Field Work


Chief, Division of Charts


Chief, Div. of H. and T.

AND REFER TO No. 82-DRM

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

WASHINGTON

July 25, 1933.

SECTION OF FIELD RECORDS

Review of Hydrographic Sheet No. 5209 (Continued)

Northern part of Maro Reef, Hawaiian Is.

Surveyed in 1931

Instructions dated Feb. 10, 1930 (PIONEER)

Hand lead and fathometer soundings

DECLASSIFIED BY NOAA
PURSUANT TO DOC. SYSTEMATIC REVIEW
GUIDELINES AS DESCRIBED IN SECTION
3.3(a) EXECUTIVE ORDER 12356.

Chief of Party, O. W. Swainson
Surveyed by E. O. Heaton, P. L. Bernstein, V. M. Gibbens
Protracted by J. C. Ellerbe
Soundings plotted by C. J. Wagner
Verified by G. H. Streeter

1. The records conform to the requirements of the Hydrographic Manual except that the stamped form descriptive of the sounding apparatus was not completely filled out. The weight of the lead used in hand lead work was entered as 9 lbs. on blue e day and f day, but was not given on other days. As a 6 lb. lead was used in the work on the adjoining sheet H. 5209, this information was of some importance.
2. The plan and extent of the survey satisfy the instructions except that small boat passages through reefs were not developed (paragraph 16a), but it is doubtful if this was meant to apply to an area of this character.
3. There are only a few cross lines on the southwest corner of the sheet. The fathometer soundings are slightly shoaler than the hand lead soundings but the discrepancy is seldom more than one fathom. On the greater part of the sheet only enough development was done to show the character of the bottom. The descriptive report states, "It was not attempted to locate all the shoal spots, but enough of them to indicate the character of the area surveyed and to show where a vessel could anchor or navigate and where it could not."
4. The usual reef symbol for reefs bare at mean lower low water has been inked on the sheet, for the reefs sketched by the field party, but these reefs are not entirely bare as they have anywhere from a few inches to two fathoms of water over them in some places. See paragraph under "Dangers" in the descriptive report.
5. Depth curves - the information is not sufficient for drawing the depth curves except in the small area in the southwest corner of the sheet. On the other portion of the sheet, curves have been inked only around some of the isolated shoal spots as the sounding lines are too widely spaced to draw the outline of shoal areas with any degree of accuracy.

6. The junction on the west with H. 5214 and H. 5215 is satisfactory although the fathometer soundings from H. 5214 are generally about one fathom shoaler than the hand lead soundings on this sheet, H. 5210. A closer junction should have been made on the east with H. 5214.

The junction on the south with H. 5209, across the main body of Maro Reef, is not at all close. Additional lines might have been run between long. $170^{\circ} 30'$ and long. $170^{\circ} 36'$.

The junction on the north with H. 5213 is not satisfactory. There is a large gap between long. $170^{\circ} 35'$ and long. $170^{\circ} 40'$ and another gap west of long. $170^{\circ} 31'$.

7. Character and scope of surveying - This survey has not the accuracy of the usual hydrographic survey as it is dependent upon the position of a control buoy as determined by sextant observations on a star, (see paragraph 3, descriptive report). Signal "Mark" was found to have been constantly moving during the progress of the work. In scope the survey is incomplete and lacking in details but gives a very good idea of the character of the area.

This sheet, H. 5210, should not be issued for confidential use without pertinent extracts from the descriptive report to show its limitations. A photo survey of the reef with this survey as control probably would serve military purposes to the best advantage. (See memo. below.)

8. Additional work is recommended to fill in the gap between the northern limits of this sheet, H. 5210, and the limits of H. 5217, from long. $170^{\circ} 35'$ to long. $170^{\circ} 40'$.

9. Reviewed by R. L. Johnston. April 20, 1933.

Sheet inspected by A. L. Shalowitz. See memorandum attached.

Memorandum by A. L. Shalowitz

1. Delineation of coral reefs - Attention is called to the fact that the coral reefs indicated on the sheet, with very few exceptions, have not been accurately located. Only in those cases where a sounding line runs in close proximity to the reef is there any semblance of accuracy. In many cases the limits and extent of the reefs have been sketched on the boat sheet from estimated distances running as much as 600 meters (see pos. 7 f, blue). The reefs were plotted on the smooth sheet by the field party and were accepted by the verifier.

2. Character of the work - With the exception of the area at the western end of the sheet, the remainder of the survey is of a very approximate and incomplete nature. The sparseness of the sounding lines over the major portion of the sheet and the approximate location of many of the coral reefs, together with the inability to completely draw most of the depth curves, requires that the survey be classed as reconnaissance and as indicating in a general way only the character of the area surveyed.

Approved as reconnaissance sheet:

L.O. Dolbert
Chief, Section of Field Records

Chief, Section of Field Work

W. R. Rabinbach
Chief, Division of Charts

Chief, Div. of H. and T.

H-5209	Applied to Chart 4182	7/24/40	C.R.B.Jr.
H-5210	" " " "	7/25/40	BBJ.